Introduction to Operating Systems

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Module 1 - What will be covered?

- File System concepts, Access methods, Allocation methods, Directory systems, File protection.

- Disk Management-Disk scheduling, Disk management, Disk reliability.

- Linux: History of Linux: Linux Operating System Layers, The Linux Shell Process: (parent and child processes), Files and Directories (File Structure and directory structure)

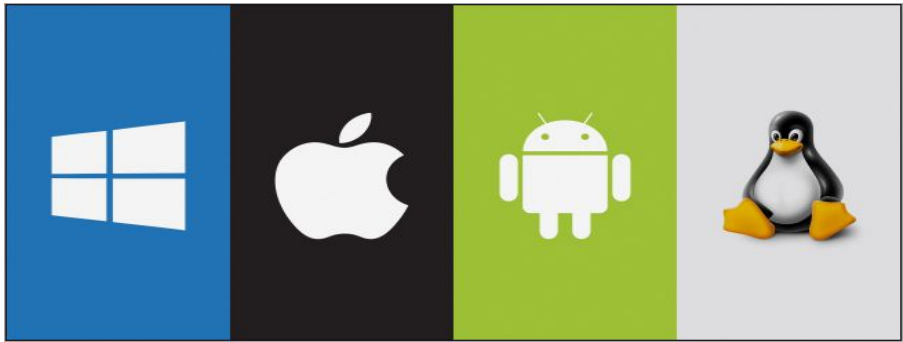
- Linux Basic commands: pwd, cd, mkdir,rm,mv,touch,man,cp,locate, echo, cat, touch, ls,cut, paste and other basic shell management commands

What is an Operating System?

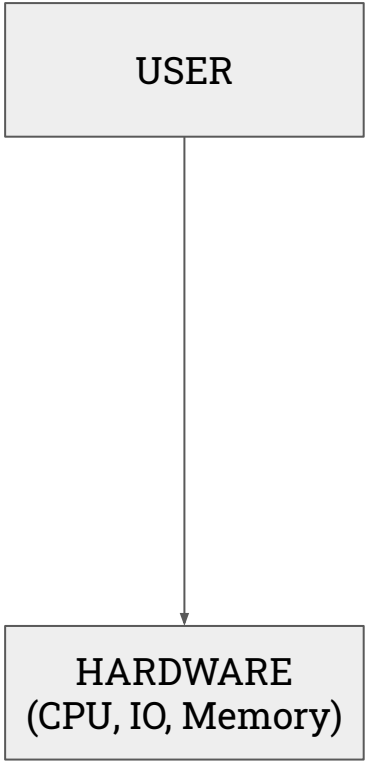
- **System Software**
  - What is a **Software**? - Tested Programs + Documentation
  - Categories of Softwares
    - Application Softwares and System Softwares

- **Acts as an interface between hardware and the user**
  - What do you mean by an interface?

- Can you name some Operating Systems?
  - Microsoft Windows, Linux, Mac, Android, iOS, etc.



Why we need Operating Systems?



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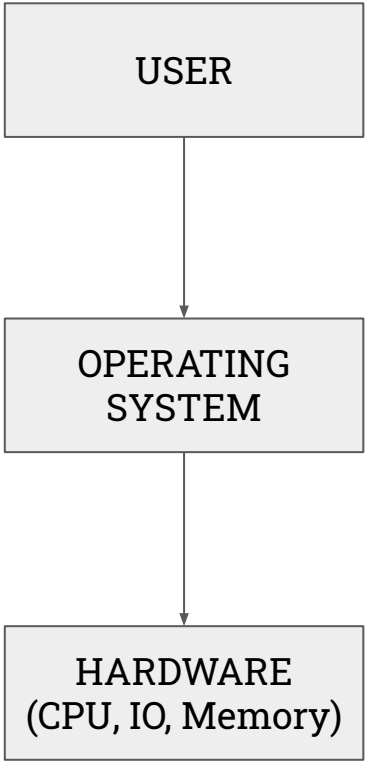

Which one do you prefer?

Two viewpoints of OS

- **User View (Case 1)**
    - Most users sit in front of a PC consisting of a Monitor, Keyboard, Mouse and System Unit
    - Designed for monopolize it’s resources
    - Goal is to maximize the work the user is performing
    - Ease of use, but some attention to performance too
    - Least bothered about the resource utilization: how various resources are shared

Two viewpoints of OS

- **User View (Case 2)**
    - User sits at a terminal connected to a **mainframe** or a **mini computer**
    - Other users are accessing the same computer through **terminals**
    - Users share resources
    - Designed to maximize resource utilization
    - Some computers have little or no user view - embedded computers in home devices and automobiles

Two viewpoints of OS

- **System View**
  - From the computer’s point of view, OS is the most intimate friend of the Hardware
  - Operating System as a **Resource Allocator**
  - Resources - CPU Time, memory space, file storage, IO Devices, etc.
  - OS acts as the manager of these resources - decide how to allocate the resources to specific programs and users.

Some basic functionalities of OS

(1) Resource Manager
   (a) CPU - Processor Management (through Scheduling)
   (b) Memory - RAM (How the memory is allocated)
   (c) Input - Output Devices

(2) Memory Management
   (a) Space for the process should be created in RAM
   (b) Example of hello.c program
      (i) Hello.c (Secondary memory) -> hello.obj -> Process -> Memory

(3) I/O Devices Management

Some basic functionalities of OS

(1) Storage Management (Secondary Memory)
   (a) How the data is permanently stored in hard disk
   (b) File Systems - FAT, NTFS, etc.
   (c) Directory Management

(2) Security and Protection
   (a) Password Protection
   (b) Security at the process level
      (i) Hello.c (Secondary memory) -> hello.obj -> Process -> Memory

Goal of Operating Systems

(1) Convenience
   (a) Easy to Use (User friendliness)

(2) Efficiency
   (a) Example of mainframe or super computers

Types of Interfaces

   (a) GUI & CUI
   (b) System calls and System Commands